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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/553,776	04/21/2000	Venugopal Srinivasan	28049/36451	6850
34431	7590	02/08/2006	EXAMINER	
HANLEY, FLIGHT & ZIMMERMAN, LLC 20 N. WACKER DRIVE SUITE 4220 CHICAGO, IL 60606			ODOM, CURTIS B	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/553,776

Applicant(s)

SRINIVASAN, VENUGOPAL

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-21 is/are allowed.
- 6) ☒ Claim(s) 1-17 and 22-38 is/are rejected.
- 7) ☒ Claim(s) 39-41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 11-13, 22-24 and 32-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Der Vleuten et al. (U. S. Patent No. 6, 535, 845).

Regarding claim 1, Van Der Vleuten et al. discloses an encoder (Fig. 19) having an input and an output, wherein the input receives a signal, wherein the encoder calculates (column 14, line 56-column 15, line 21) an entropy (probability signal) of at least a portion of the signal and encodes the signal (column 7, lines 27-43 and column 16, lines 3-27) to insert an ancillary code (side information) representing the calculated entropy (column 24, lines 1-5, probability signal) and wherein the output carries the encoded signal, which includes the ancillary code (column 24, lines 1-5).

Regarding claim 2, which inherits the limitations of claim 1, Van Der Vleuten et al. discloses the signal is an audio signal (column 16, lines 55-65).

Regarding claim 3, which inherits the limitations of claim 1, Van Der Vleuten further discloses the encoder determines the entropy value based on a summation of probabilities (column 15, lines 38-43).

Regarding claim 11, Van der Vleuten et al. discloses a decoder (Fig. 20) having an input and an output, wherein the input receives a signal (column 15, line 44-column 16, line 14), which includes an ancillary code (side information) representing an entropy value (column 24, lines 1-5) wherein the decoder decodes the signal to extract the ancillary code (column 25, lines 58-60) to read the entropy value (probability signal) from the signal and wherein the output carries a signal based upon the decoded entropy code (column 15, lines 44-55).

Regarding claim 12, which inherits the limitations of claim 11, Van Der Vleuten et al. discloses the signal is an audio signal (column 16, lines 55-65).

Regarding claim 13, which inherits the limitations of claim 13, Van Der Vleuten et al. discloses the entropy value represents an entropy having a value based on a summation of probabilities (column 15, lines 38-43).

Regarding claims 22-24 and 32-34 the claimed method includes features corresponding to the above rejection of claims 1-3 and 11-13 which is applicable hereto.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 7, 14, 15, 25, 28, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Vleuten et al. (U. S. Patent No. 6, 535, 845) in view of Bingham (U. S. Patent No. 3, 937, 882). Regarding the above claims, Van Der Vleuten discloses all the limitations of the above claims (see 102 rejection above) including the entropy value (side information) is comprised of bits (column 7, lines 27-43). Van Der Vleuten et al. does not disclose the encoding/decoding (modulate/demodulation) of the signal including the ancillary code (side information) is encoded/decoded (modulated/demodulated) by amplitude modulating/demodulating the signal at a pair of frequencies to preserve an entropy of the encoded portion of the signal or swapping a spectral amplitude of at least two frequencies in the signal.

Bingham discloses amplitude modulating/demodulating a signal at a pair of frequencies (column 1, lines 63-69 including swapping (switching) two frequencies in the signal (column 3, lines 49-62) in order to preserve the data within the signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission/reception (coding/decoding) method/apparatus of Van Der Vleuten et al. with the teachings of Bingham since Bingham states the amplitude modulation/demodulation (encoding/decoding) method allows for an efficient use of available bandwidth and communication at high data rates (column 1, lines 54-68).

5. Claims 5, 6, 8, 16, 26, 27, 29 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Vleuten et al. (U. S. Patent No. 6, 535, 845) in view of Tani et al. (6, 470, 042). Regarding the above claims, Van Der Vleuten discloses all the limitations of the

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above claims (see 102 rejection above) including the entropy value (side information) is comprised of bits (column 7, lines 27-43). Van Der Vleuten et al. does not disclose the signal is encoded to preserve an entropy of the encoded portion of the signal, and the signal is encoded/decoded using frequency hopping.

Tani et al. discloses encoding/decoding (transmitting/receiving) a signal using frequency hopping which allows multiple users to communicate simultaneously by using different hop sequences (column 1, lines 19-30). Tani et al. also discloses that frequency hopping allows the preservation of the data (encoded) signal by removing from the hop sequences communication frequencies which are impaired and may interfere with the signal (column 4, lines 44-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission/reception (coding/decoding) method/apparatus of Van Der Vleuten et al. with the teachings of Tani et al. since Tani et al. that frequency hopping preserves a signal by avoiding the effects of fixed-frequency sources of interference or channel degradation (column 4, lines 44-55).

6. Claims 9, 17, 30, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Vleuten et al. (U. S. Patent No. 6, 535, 845) in view of Roberts et al. (6, 313, 932).

Regarding the above claims, Van Der Vleuten discloses all the limitations of the above claims (see 102 rejection above) except the encoding/decoding (modulate/demodulation) of the signal including the ancillary code (side information) is encode/decoded (modulate/demodulated) by spectral modulation.

Roberts et al. discloses encoding/decoding (modulating/demodulating) signals using spectral modulation (Fig. 7). Therefore, it would have been obvious to one skilled in the art at

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the time the invention was made to modify the transmission/reception (coding/decoding) method/apparatus of Van Der Vleuten et al. with the teachings of Roberts et al. since Roberts et al. states that spectral modulation utilizes a broad bandwidth for each modulation pulse (column 9, lines 31-48). Thus, it would also be obvious that utilization of a broad bandwidth would allow for higher transmission data rates to be achieved.

7. Claims 10 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Vleuten et al. (U. S. Patent No. 6, 535, 845) in view Osawa previously cited in Office Action (9/30/2003).

Regarding claims 10 and 21, Van Der Vleuten et al. discloses all the limitations of the above claims (see 102 rejection above) except the entropy (probability) value of the ancillary code (side information) in calculated using histograms.

Osawa discloses calculating an entropy value used for encoding and decoding using histograms which allows for dynamic probability estimation (column 2, lines 59-67, column 6, lines 40-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the calculation method of Van Der Vleuten et al. with the teachings of Osawa and implement dynamic probability estimation using histograms since Osawa states that dynamic probability estimation improves coding efficiency (column 2, lines 59-67).

Allowable Subject Matter

8. Claims 18-21 are allowable over prior art references because related references do not disclose comparing an entropy value in the signal with an entropy value determined at the decoder.

9. Claims 39-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because related references do not disclose comparing an entropy value in the signal with an entropy value determined at the decoder.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
February 4, 2006


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER